



Flight Safety Foundation

CFIT Checklist

Evaluate the Risk and Take Action

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Flight Safety Foundation (FSF) designed this controlled-flight-into-terrain (CFIT) risk-assessment safety tool as part of its international program to reduce CFIT accidents, which present the greatest risks to aircraft, crews and passengers. The FSF CFIT Checklist is likely to undergo further developments, but the Foundation believes that the checklist is sufficiently developed to warrant distribution to the worldwide aviation community.

Use the checklist to evaluate specific flight operations and to enhance pilot awareness of the CFIT risk. The checklist is divided into three parts. In each part, numerical values are assigned to a variety of factors that the pilot/operator will use to score his/her own situation and to calculate a numerical total.

In *Part I: CFIT Risk Assessment*, the level of CFIT risk is calculated for each flight, sector or leg. In *Part II: CFIT Risk-reduction Factors*, Company Culture, Flight Standards, Hazard Awareness and Training, and Aircraft Equipment are factors, which are calculated in separate sections. In *Part III: Your CFIT Risk*, the totals of the four sections in *Part II* are combined into a single value (a positive number) and compared with the total (a negative number) in *Part I: CFIT Risk Assessment* to determine your CFIT Risk Score. To score the checklist, use a nonpermanent marker (do not use a ballpoint pen or pencil) and erase with a soft cloth.

Part I: CFIT Risk Assessment

	Value	Score
Section 1 – Destination CFIT Risk Factors		
Airport and Approach Control Capabilities:		
ATC approach radar with MSAWS	0	_____
ATC minimum radar vectoring charts	0	_____
ATC radar only	-10	_____
ATC radar coverage limited by terrain masking	-15	_____
No radar coverage available (out of service/not installed)	-30	_____
No ATC service	-30	_____
Expected Approach:		
Airport located in or near mountainous terrain	-20	_____
ILS	0	_____
VOR/DME	-15	_____
Nonprecision approach with the approach slope from the FAF to the airport TD shallower than 2 3/4 degrees	-20	_____
NDB	-30	_____
Visual night "black-hole" approach	-30	_____
Runway Lighting:		
Complete approach lighting system	0	_____
Limited lighting system	-30	_____
Controller/Pilot Language Skills:		
Controllers and pilots speak different primary languages	-20	_____
Controllers' spoken English or ICAO phraseology poor	-20	_____
Pilots' spoken English poor	-20	_____
Departure:		
No published departure procedure	-10	_____
Destination CFIT Risk Factors Total (-)		_____

Section 2 – Risk Multiplier

	Value	Score
Your Company's Type of Operation (select only one value):		
Scheduled	1.0	_____
Nonscheduled	1.2	_____
Corporate	1.3	_____
Charter	1.5	_____
Business owner/pilot	2.0	_____
Regional	2.0	_____
Freight	2.5	_____
Domestic	1.0	_____
International	3.0	_____
Departure/Arrival Airport (select single highest applicable value):		
Australia/New Zealand	1.0	_____
United States/Canada	1.0	_____
Western Europe	1.3	_____
Middle East	1.1	_____
Southeast Asia	3.0	_____
Euro-Asia (Eastern Europe and Commonwealth of Independent States)	3.0	_____
South America/Caribbean	5.0	_____
Africa	8.0	_____
Weather/Night Conditions (select only one value):		
Night — no moon	2.0	_____
IMC	3.0	_____
Night and IMC	5.0	_____
Crew (select only one value):		
Single-pilot flight crew	1.5	_____
Flight crew duty day at maximum and ending with a night nonprecision approach	1.2	_____
Flight crew crosses five or more time zones	1.2	_____
Third day of multiple time-zone crossings	1.2	_____

Add Multiplier Values to Calculate Risk Multiplier Total**Destination CFIT Risk Factors Total * Risk Multiplier Total = CFIT Risk Factors Total (-)** _____***Part II: CFIT Risk-reduction Factors*****Section 1 – Company Culture**

	Value	Score
Corporate/company management:		
Places safety before schedule	20	_____
CEO signs off on flight operations manual	20	_____
Maintains a centralized safety function	20	_____
Fosters reporting of all CFIT incidents without threat of discipline	20	_____
Fosters communication of hazards to others	15	_____
Requires standards for IFR currency and CRM training	15	_____
Places no negative connotation on a diversion or missed approach	20	_____

115-130 points

Tops in company culture

105-115 points

Good, but not the best

80-105 points

Improvement needed

Less than 80 points

High CFIT risk

Company Culture Total (+) _____ *

Section 2 – Flight Standards

Specific procedures are written for:

	Value	Score
Reviewing approach or departure procedures charts	10	
Reviewing significant terrain along intended approach or departure course	20	
Maximizing the use of ATC radar monitoring	10	
Ensuring pilot(s) understand that ATC is using radar or radar coverage exists	20	
Altitude changes	10	
Ensuring checklist is complete before initiation of approach	10	
Abbreviated checklist for missed approach	10	
Briefing and observing MSA circles on approach charts as part of plate review	10	
Checking crossing altitudes at IAF positions	10	
Checking crossing altitudes at FAF and glideslope centering	10	
Independent verification by PNF of minimum altitude during stepdown DME (VOR/DME or LOC/DME) approach	20	
Requiring approach/departure procedure charts with terrain in color, shaded contour formats	20	
Radio-altitude setting and light-aural (below MDA) for backup on approach	10	
Independent charts for both pilots, with adequate lighting and holders	10	
Use of 500-foot altitude call and other enhanced procedures for NPA	10	
Ensuring a sterile (free from distraction) cockpit, especially during IMC/night approach or departure	10	
Crew rest, duty times and other considerations especially for multiple-time-zone operation	20	
Periodic third-party or independent audit of procedures	10	
Route and familiarization checks for new pilots		
Domestic	10	
International	20	
Airport familiarization aids, such as audiovisual aids	10	
First officer to fly night or IMC approaches and the captain to monitor the approach	20	
Jump-seat pilot (or engineer or mechanic) to help monitor terrain clearance and the approach in IMC or night conditions	20	
Insisting that you fly the way that you train	25	

300-335 points	Tops in CFIT flight standards
270-300 points	Good, but not the best
200-270 points	Improvement needed
Less than 200	High CFIT risk

Flight Standards Total (+) _____ *

Section 3 – Hazard Awareness and Training

	Value	Score
Your company reviews training with the training department or training contractor	10	
Your company's pilots are reviewed annually about the following:		
Flight standards operating procedures	20	
Reasons for and examples of how the procedures can detect a CFIT "trap"	30	
Recent and past CFIT incidents/accidents	50	
Audiovisual aids to illustrate CFIT traps	50	
Minimum altitude definitions for MORA, MOCA, MSA, MEA, etc.	15	
You have a trained flight safety officer who rides the jump seat occasionally	25	
You have flight safety periodicals that describe and analyze CFIT incidents	10	
You have an incident/exceedance review and reporting program	20	
Your organization investigates every instance in which minimum terrain clearance has been compromised	20	

You annually practice recoveries from terrain with GPWS in the simulator	40	_____
You train the way that you fly	25	_____
285-315 points	Tops in CFIT training	Hazard Awareness and Training Total (+) _____
250-285 points	Good, but not the best	
190-250 points	Improvement needed	
Less than 190	High CFIT risk	

Section 4 – Aircraft Equipment

	Value	Score
Aircraft includes:		
Radio altimeter with cockpit display of full 2,500-foot range — captain only	20	_____
Radio altimeter with cockpit display of full 2,500-foot range — copilot	10	_____
First-generation GPWS	20	_____
Second-generation GPWS or better	30	_____
GPWS with all approved modifications, data tables and service bulletins to reduce false warnings	10	_____
Navigation display and FMS	10	_____
Limited number of automated altitude callouts	10	_____
Radio-altitude automated callouts for nonprecision approach (not heard on ILS approach) and procedure	10	_____
Preselected radio altitudes to provide automated callouts that would not be heard during normal nonprecision approach	10	_____
Barometric altitudes and radio altitudes to give automated "decision" or "minimums" callouts	10	_____
An automated excessive "bank angle" callout	10	_____
Auto flight/vertical speed mode	-10	_____
Auto flight/vertical speed mode with no GPWS	-20	_____
GPS or other long-range navigation equipment to supplement NDB-only approach	15	_____
Terrain-navigation display	20	_____
Ground-mapping radar	10	_____
175-195 points	Excellent equipment to minimize CFIT risk	Aircraft Equipment Total (+) _____
155-175 points	Good, but not the best	
115-155 points	Improvement needed	
Less than 115	High CFIT risk	

Company Culture _____ + Flight Standards _____ + Hazard Awareness and Training _____

+ Aircraft Equipment _____ = CFIT Risk-reduction Factors Total (+) _____

* If any section in Part II scores less than "Good," a thorough review is warranted of that aspect of the company's operation.

Part III: Your CFIT Risk

Part I CFIT Risk Factors Total (-) _____ + Part II CFIT Risk-reduction Factors Total (+) _____
= CFIT Risk Score (\pm) _____

A negative CFIT Risk Score indicates a significant threat; review the sections in Part II and determine what changes and improvements can be made to reduce CFIT risk.

In the interest of aviation safety, this checklist may be reprinted in whole or in part, but credit must be given to Flight Safety Foundation. To request more information or to offer comments about the FSF CFIT Checklist, contact Robert H. Vandel, director of technical projects, Flight Safety Foundation, 601 Madison Street, Suite 300, Alexandria, VA 22314 U.S., Phone: 703-739-6700 • Fax: 703-739-6708